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EDGE-OF-TOWN SHOPPING

Edge-of-town District Shopping Centres : A General Approach.

in about 21,000 words

by

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Dissertation, submitted as  
part of the requirements for  
the degree of Master of Philosophy  
in Town and Regional Planning.

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APRIL, 1975.

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## INTRODUCTION

This work is entitled "Edge-of-town district shopping centres : a general approach" because the objective is to examine this form of retailing in principle rather than in any individual case. The analysis is concerned with medium-sized centres (of about 40-100,000 ft<sup>2</sup> total retail sales area) situated not in the middle of a town or suburb but near the periphery of the built-up area of a city or conurbation.

The possibility of this kind of development flouts the customary assumption that traders prefer to open shops in established centres. Provided that the shop is large enough (ten to a hundred times the size of a small supermarket) it has in the last decade or two become feasible to operate on a 'greenfield' site. The shop provides car-parking, a very wide range of goods, and a high standard of ambience, and it generates its own customers. They will undertake a special journey to visit it. So it can be located on its own, miles from its competitors and the homes of its customers.

Such developments are rare (but not unknown) in the United Kingdom, chiefly because of resistance from town-and-country planners. In the United States and in France particularly, they are commonplace. Consequently, shopping is much more likely in those countries to take place by car, in the evening, or on Sundays.

In the U.K., the supermarket revolution of the '50s and '60s was accepted. But the demand from the retailing industry for even larger self-service units called "superstores" or "hypermarkets" (see page 17) has been resisted. The issue is how far this resistance should be relaxed. The possibility of positively steering this kind of development to areas where its social benefit would be greatest is discussed.

The context for any such development is a pattern of shopping which will by and large continue to exist. Like supermarkets, "superstores" would infiltrate, not replace, the established network of outlets. Chapter 1 is therefore a description of the underlying framework.

Chapter 2 examines the causes of the demand for change. The intention to develop superstores is shown to be the retailing industry's response to the effects on consumer behaviour of the growth in the levels of ownership of cars, refrigerators, and deep freezers.

Part 2 is the analysis of the effects of edge-of-town development. Chapter 3 considers this option from the retailer's standpoint. It is suggested that many of the advantages of the supermarket chain are combined with those of the department store. The trader benefits from a reduction in pressures on space and from organisational economies of scale.

In Chapter 4, the customer's view is considered. The suggestions that he gains through lower prices and through greater



convenience and comfort of shopping are discussed. Because of their salience for planning, external effects are examined in Chapter 5. Consequences for other shops, other land uses, amenity and traffic are analysed.

Particular attention is given in Chapter 6 to areas whose population is small but expected to grow. It has been argued that the shopping centre in such districts ought on welfare grounds to be subsidised out of public funds. It is suggested here that this may not be necessary because an edge-of-town centre is often a viable alternative. This would imply that the planners should promote the development of such centres in these situations.

Part 3 sets the edge-of-town centre in the wider context of shopping policy planning. From the basis of an economic analysis of the theoretical justification for any new shop building, it is hypothesised that the quantity and spatial pattern of future demand must be predicted. Forecasting methodologies called "models" (page 52) and "analogs" (page 58) are explained, and the latter is applied in Chapter 8 to a hypothetical situation in order to illustrate against a common background the differences between a conventional and an edge-of-town centre.

PART 1 : THE PATTERN OF SHOPPING.Chapter 1. The Traditional Pattern of Shopping.

The principal determinants of the geographical dispersion of shops are the density of population, the distance people travel to purchase goods and the expenditure per head on each good sold (which are affected by prices in different shops). Both distance travelled and expenditure vary amongst goods. In particular, goods can be divided into two broad categories : those which are bought frequently, fairly regularly, and in units of low value, by most or all households : called "convenience" goods; and those which are only bought occasionally, usually one at a time, and often in units of higher value, by any given household : called "comparison" goods.

Most "convenience" goods expenditure is on food, but drink and tobacco, confectionery, and newspapers and magazines are clearly also bought on a similar basis, and the label "convenience" derives from the assumption<sup>1</sup> that the purchaser of these items wants to obtain them as near to his home<sup>2</sup> as possible. In contrast, he is assumed willing to sacrifice proximity in order to be able to compare prices, qualities, or styles, of furniture, hardware and other household goods, jewellery, sports goods, and clothing and footwear. These are therefore grouped as "comparison" goods. There is no agreed arbitrary division between the classes, and chemists' goods and photographic equipment, bicycles and prams, and books and stationery are marginal cases.

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1 c.f. Table 3.

2 About 90% of convenience shopping trips start from the shopper's home. See Table 2.

Table 1 : Usage of Certain Shopping Centres.

All figures are percentages.  
The five sets of figures are not  
strictly comparable.

	(Convenience)	(Neighbourhood centres)			(All shopping)
	Glasgow <sup>3</sup>	Cwmbran <sup>4</sup>	Exeter <sup>5</sup>	N.P.B.I. <sup>6</sup>	Brighton area <sup>7</sup>
<u>Means of Transport used:</u>					
Walk	67	87	73	72	67
Car	15	9	21		14
Bus	17	3	4		15
					(All journeys)
<u>Day of Principal Shopping:</u>					
None	6		16	-	-
Monday	3		3	4	14
Tuesday	4 <sup>+</sup>		12	12	18
Wednesday	3		3 <sup>+</sup>	7	14
Thursday	16		15	19	15
Friday	42		38	43	19
Saturday	26		13	21	20
Sunday	0.1		-	-	1
<sup>+</sup> early closing day	(to any centre)	(to one particular centre)			
<u>Frequency of visit:</u>					
daily	61	45	43		
2-5 times/week	33	37	35		
weekly	4	7	14		
less than weekly	0.5	9	8		
					(Food shopping)
<u>Distance travelled:</u>					
less than $\frac{1}{2}$ mile		} 90	76		65
$\frac{1}{2}$ mile - 1 mile			13		15
1 - 2 miles		2	5		13
over 2 miles		8	6		7

Table continued....

Table 1 : Usage of Certain Shopping Centres, contd.

	(Convenience)	(Neighbourhood centres)			
	Glasgow <sup>3</sup>	Cwmbran <sup>4</sup>	Exeter <sup>5</sup>	N.P.B.I. <sup>6</sup>	Brighton area <sup>7</sup>
<u>Journey time:</u>		(Estimate*)			
5 minutes or less	49	55	58		
6-10 minutes	30	21	23		
11-20 minutes	17	18	} 15		
over 20 minutes	4	6			
* interpolating from data at different class intervals					

## Footnotes:

3. Figures given to me by Mr. William Nicoll, Strathclyde University, from a sample of households conducted in the Greater Glasgow Transportation Study area in 1974.

4. Source: Dawson and Kirby (1974).

5. Source: Department of Geography, St. David's University College, Lampeter (1974).

6. Source: National Board for Prices and Incomes (1971).

7. Source: Ambrose (1967/8).

The commonest method by which a household obtains its convenience goods is for a member to walk for about five minutes to the shops daily or every few days, but getting the bulk of the shopping on one particular day each week (see Table 1).

The table shows that at least two-thirds of shoppers walk to do their convenience shopping, and at least three-quarters take a trip of ten minutes or less. 80 or 90 percent of convenience journeys are of less than a mile each way, including those using mechanised transport. A similar proportion of shoppers have a definite major shopping day of the week, most commonly Friday, but over three-quarters of them supplement this journey with purchases of convenience goods on other days, about half getting something (perhaps only a newspaper) every day.

This pattern is only possible because convenience shops exist in all these towns within ten minutes' walk of most homes<sup>8</sup>. Exactly what goods are available within this radius from any particular house is a function of many factors, including population density, age and tenure of housing<sup>9</sup>, and social class. Thus, a study in Leeds<sup>10</sup>, which compares a low- and a high-income neighbourhood near the city boundary, shows that isolated grocers occur in both, and that a fishmonger, a butcher, a baker, a greengrocer, an ironmonger, and a newsagent are found in local parades of shops in both areas. But whereas the commonest shops in the low-income area apart from grocers

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8 The national averages for each of these parameters are likely to be lower than the figures in Table 1 because of the lower density of shops (per acre) in rural areas.

9 For example, in the Dalmarnock district of Glasgow, no shops were built into the 1937 Corporation housing scheme which contains about 700 dwellings and is over half a mile long. (Two Pakistani-run huts selling groceries have recently appeared there.) By contrast, nearby nineteenth-century tenements are invariably within 100 yards of a shop.

10 Source: Davies (1968).

are the off-licence and the fish-and-chip shop, both appear only in the major centre of the high-income district. Broadly the opposite is true of the chemist and the stationers.

These local parades correspond to the neighbourhood centres in Exeter and Cwmbran, for which it was assumed that data for 'all shopping' could validly be used as if it were data for convenience shopping. This assumption is supported by the Leeds evidence that nine out of the eleven types of goods available at three or more shops in the two areas (excluding the main centres) are classified on page 1 as convenience goods or marginal. The other two were hardware and toys.

At the opposite end of the hierarchy is the regional shopping centre, to which people travel further, less often, and less commonly on foot (except from work), but where they spend more per trip (Table 2).

Between the regional and the neighbourhood centre comes the district centre. This label covers both the town-centres of medium-sized freestanding towns, like Ripon, and major suburban centres in cities, like Glasgow's Shawlands Cross. The District Centre generally contains a mixture of food shops (noticeably self-service outlets) catering primarily for weekly shopping, and non-food shops selling predominantly fairly standardised goods in common demand, e.g. shoe shops, off-the-peg outfitters, television hire concerns. The Exeter study<sup>5</sup> identified two and a half district centres: St. Thomas, serving the part of the city west of the River Exe; Heavitree, about  $1\frac{1}{2}$  miles east of the city-centre; and Topsham,

**Table 2 : The Hierarchy of Shopping Centres.**

(From the Exeter study)

All figures are percentages.

(series that do not sum to 100 are due to non-response)

	City-centre	Heavitree (District centre)	Neighbourhood Centres (average of 4)
<u>Frequency of visit:</u>			
daily	24	24	43
2-5 times per week	30	42	35
weekly	28	22	14
less than weekly	19	12	8
<u>Proportion of trips originating at:</u>			
home	71	92	88
work	25	}	}
other	4		
<u>Distance travelled:</u>			
less than $\frac{1}{2}$ mile	19	61	76
$\frac{1}{2}$ - 1 mile	15	19	13
1 - 2 miles	20	10	5
2 - 3 miles	13	1	1
over 3 miles	33	9	5
<u>Journey time:</u>			
5 minutes or less	10	49	58
6 - 10 minutes	32	27	23
over 10 minutes	56	24	15
<u>Mode of transport:</u>			
walk	28	73	73
car	33	19	21
bus	32	6	4
<u>Amount spent per trip:</u>			
less than £1	19	30	29
£1 - £3	20	24	36
£3 - £5	25	26	16
£5 - £10	28	17	17
more than £10	8	3	3

four miles down river from the city-centre, which is really the local centre for the port village of Topsham (only recently incorporated within Exeter), but is upgraded by the trade it attracts from villages further out.

This intermediate-status centre is a reminder that any classification is arbitrary. But this threefold division has been in widespread use, especially since Burns's classical theoretical study of the shopping hierarchy was published in 1959<sup>11</sup>. He advocated a system of retail distribution "built around 'corner' or isolated shops serving frequent needs with a growing proportion of standardised goods and serving also the sociological needs of the housewife for meeting neighbours, talking and gossip. The service of these isolated shops will be complementary to that of the large suburban centres where a great selection of goods, price, and quality will be available within not much more than a mile or so of the home. Finally, the central shopping area of the town or city will provide for the satisfaction not only of unresolved selectivity considerations but also of status value considerations; it will be a highly specialist centre." However, "in towns with populations below about 150,000 ..... if the distance between the town-centre and the boundary of the residential development is only about two miles, one would not expect to see the development of large shopping centres away from, and to the detriment of, the main town-centre."

A further subdivision is possible in the most densely populated areas: regional centres can be classified by volume of trade into major (or Grade I) and minor (or Grade II). In the

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11 Source: Burns (1959)



West Yorkshire Study<sup>12</sup>, for example, Leeds and Bradford only are classified as Grade I; centres such as Halifax and Huddersfield are recorded as Grade II.

The role of regional centres is predominantly the sale of comparison goods, but a little convenience trade is also done (Table 3). In the West Yorkshire Study, it is estimated that Grade I centres supply 5 - 7½% of the convenience shopping of their Grade II hinterland, and Grade II centres retain 20 - 25% of the convenience shopping of their Grade II hinterland. These centres are dominated, nevertheless, by department and variety stores; furniture, electrical goods, and clothing, which are also on sale in district centres (Grade III) are widely available in regional centres; whilst convenience goods, which form the overwhelming bulk of the trade of local centres (see Table 4) are also found at all higher levels in the hierarchy<sup>13</sup>. For the larger centres tend to serve for the population nearest them the role elsewhere played by smaller centres.

12 Source: Brooksbank and others (1970).

13 The devisers of the 1971 Census of Distribution (whose results will be over a year late) presumably had this kind of hierarchy in mind when they aggregated the Preliminary Results by seven categories of shop: grocers and provision dealers; other food retailers; confectioners, tobacconists and newsagents; clothing and footwear shops; household goods shops; other non-food shops; and general stores. General stores are clearly a problem, but they are mainly very large, village post-office-stores being classified as grocers. The 'other non-food' category is less well handled, for it amalgamates jewellery, leather, and sports shops (clearly comparison) with chemists and photographic dealers (probably convenience), cycles and prams, and 'books and stationery' not subject to dominant news - not (?) to be confused with 'newsagents' who also sell books and stationery. Source: Department of Trade and Industry (1972/3).

Table 3 : Where classes of goods are bought.

- A. The probability<sup>14</sup> of each type of goods being purchased in central Sunderland or central Newcastle was shown in a subregional survey by Nader<sup>15</sup> to be:

	Probability out of 1
women's clothing	.71
jewellery	.70
children's clothing	.62
men's clothing	.59
furniture	.58
shoes	.46
cycles and prams	.43
kitchen appliances	.36
hardware	.26
T.V. sets	.25
chemists' goods	.04

- B. In P.V. Ambrose's Sussex survey<sup>7</sup>, the percentage of the named type of goods purchased at the nearest possible point was:

	%	
clothes	51	
household goods	57	
food	64	
other goods	67	(about half of these would be convenience)

---

<sup>14</sup> A probability of, for example, .71 means that the statistical chance is that for every 100 trips, 71 will be to central Newcastle or Sunderland.

<sup>15</sup> Source: Nader (1969).

For example, the Exeter city-centre serves a regional hinterland of 300-400,000 population, but 42% of its users on the survey Fridays had arrived after a journey of less than ten minutes. Even if this includes most of the 25% who came in from their place of work, it indicates that for about one in five of the users of the city-centre this is as close to home as a district or neighbourhood centre is for other citizens.

Table 4 indicates that the users of Exeter city-centre are quite evenly divided into two distinct camps: those who buy most of their food there; and those who buy most of theirs elsewhere. Conversely, the "hinterland", i.e. the area from within which shoppers come to the city-centre, is twice as populous for non-food purchases as it is for food.

For district centres, there is some evidence that the hinterland is rising from an average of around 20,000 to around 40,000 population within a radius of about one mile. The Cowley Study<sup>16</sup> shows that shoppers at that district centre,  $2\frac{1}{2}$  miles from Oxford city-centre, came from an average distance away of 1.18 miles for car owners and 1.10 miles for non-owners. Table 2 shows that 80% of shoppers at Heavitree district centre in Exeter travelled less than one mile; the comparable figure for St. Thomas is 60%; for Cwmbran town-centre, 59%.

The West Yorkshire Study<sup>12</sup> hypothesises that "the supermarket of optimum efficiency probably has a floor area of circa 12-15 thousand square feet (ft<sup>2</sup>) and needs a catchment of not less

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16 Source: Economic Development Committee for the Distributive Trades (1968).

Table 4 : Heirarchical distribution of food shopping.(From the Exeter study<sup>5</sup>).

Percentage of food shopping carried out at the stated centre:

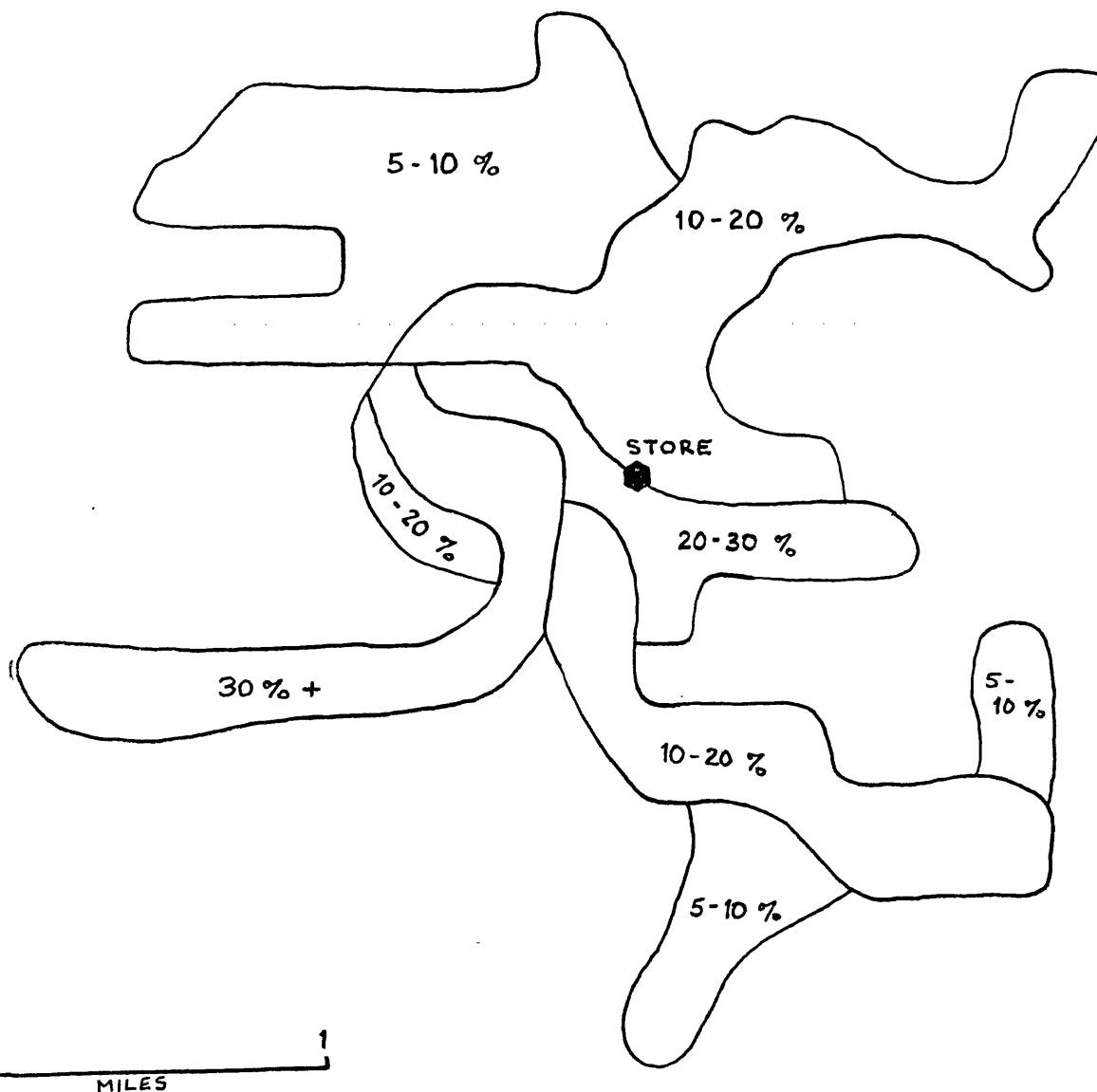
	Total	over $\frac{2}{3}$	$\frac{1}{3}$ - $\frac{2}{3}$	less than $\frac{1}{3}$
Those interviewed at:				
City-centre	100	45	6	49
(district centre)				
Heavitree	101	54	23	24
(average)				
neighbourhoods	100	50	21	29

than 30-40,000 population", and recommends centres with hinterlands of that order of magnitude. In general terms, Burns<sup>11</sup> is of the same opinion, observing that "large suburban centres ..... of 100 - 150 shops and even more ..... should serve districts of about 20,000 to 40,000 population."

It should be borne in mind, of course, that the idea of a hinterland is derived from the concept of the drainage basin of a major river. In shopping, however, there are no precise watersheds. The areas from which customers are drawn by any two centres not separated from each other by a third centre will overlap. One may prefer to measure "market penetration", that is the share of the

purchases of a class of goods by residents in a given zone that is taken by the shop or centre being analysed. Figure 1 is a 'contour' map showing the varying extent of penetration amongst areas of the hinterland for a particular (but undisclosed) American shop. The most revealing feature of this diagram is the irregularity of market penetration<sup>17</sup>.

Figure 1 - Market Penetration, Store 12.



To simplify the pattern of shopping into a heirarchy of centres, each with a catchment area for trade in each of just a few classes of goods, is but a broad approximation to reality.

## Chapter 2.      The Changing Pattern of Shopping.

The structure, and even the principle, of the hierarchy of shopping centres is being challenged by changes both on the demand and on the supply side of the retail industry.

On the demand side, the customer's facilities for the carriage and storage of goods, and in particular food, are increasing. Ownership rates for cars, fridges and deepfreezers are all rising. Tables 1 and 2 indicate that about one shopping journey in five is by car. The proportion of households with no car has declined from around 50% in 1969<sup>18</sup> to, according to the 1974 surveys,<sup>3,4,5</sup> 25% in Cwmbran, 28% in Exeter, and 55% in Glasgow (which has one of the lowest car ownership rates in Britain). In 1972, it was predicted<sup>19</sup> to reach 25% nationally by 1980.

Since the first car may be in use by the head of the household, the rate of ownership of two or more cars may be an important determinant of the number of journeys to the shops by car. In Exeter, the average is 17% of households, but it varies between 28% in Countess Wear and 5% in Foxhayes. This suggests that the impact of second cars on the pattern of activities is largely confined to high-income areas. But given that some first cars are available for shopping, it is a reasonable estimate that about 28% of households have access to a car for this purpose<sup>20</sup>.

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18 Source: Tanburn (1972).

19 Source: Economic Development Committee for the Distributive Trades (1971)

20 1971 data. Source: Murray (1973).

The distribution of shops may be modified in response to three of the effects of the use of cars for shopping. Firstly, the shopper may be willing to travel further to obtain any particular purchase.<sup>21</sup> The distance he can cover in ten minutes is greater. Moreover, he may be more willing to drive for (say) twenty minutes than to walk for twenty minutes. Secondly, he will be concerned about the ease of driving to and parking at the shopping centre. Thirdly, he may be willing to purchase a greater bulk of goods because he can carry it home in the boot of his car.<sup>22</sup>

This freedom to buy on one trip more than one can carry in two message-bags is only useful if the goods can be stored at home. In the important case of perishable foods, this facility has been provided by the growth of refrigerator ownership, which stood at 61% of households in 1969.<sup>18</sup> In the next few years, the most likely further development is a rapid rise in the ownership of deepfreezes, which in Great Britain was limited to 2% of households in 1969, compared with 17% in West Germany and 7% in the Netherlands.<sup>18</sup> By 1973, this had grown to 10.5% in Britain and was expected to expand by 4% of households per annum.<sup>23</sup>

Turning now to the supply side, the major contemporaneous change in retail methods has been the development of self-service

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21 In America, standard practice is to assume a "primary trade area" for "generative" trade of a fifteen-minutes' drive radius and a "secondary trade area" of a thirtyfive-minutes' drive radius. "Generative" trade is trade induced by the presence of the shop (through its reputation and marketing, etc.), over against "passing" trade when a shop benefits from the trade of people whose motive for being in the vicinity is other than the presence of that shop. A shop expects a greater share of the market in its "primary" than in its "secondary" trade area.

22 This case is made by T.A.D.Sainsbury (1972) and Gulliver (1972).

23 Source: SuperMarketing (25/10/74).



trading, and in particular the growth of the multiple supermarket. In 1959, 15% of grocery trade was conducted by self-service methods. By 1971, this had risen to 68%.<sup>24</sup> The bulk of this trade is taken by multiples:<sup>25</sup> in 1973, multiples took 45.6% of grocery trade, up by 1.1% on 1972.<sup>26</sup> In terms of all retail trade, the multiples accounted for 39.8% in 1971 according to the preliminary results of the Census of Distribution.<sup>27</sup> Table 5 shows how rapidly multiple traders have increased their share of the market. The greatest growth has been in the largest size-group of outlets, as indicated in Table 6.

Table 5<sup>28</sup> : Retail Sales by Types of Firm.

Index of 1969 retail sales by type of firm (1966 = 100)			
	Co-operatives	104	
	Independents	110	
	Department Stores	116	
	Other Multiples	124	

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<sup>24</sup> Source: Murray (1973).

<sup>25</sup> Multiples are (usually) defined as firms with 10 or more retail outlets, other than co-operatives, but in Table 5 department stores are separately categorised.

<sup>26</sup> Source: SuperMarketing (22/11/74).

<sup>27</sup> Source: Department of Trade and Industry (1972/3).

<sup>28</sup> Source: Economist Intelligence Unit (1970).

Table 6<sup>29</sup> : The Growth of Large Supermarkets.

Larger supermarkets have increased their share of the total supermarket sector at the expense especially of those under 4,000 ft<sup>2</sup> :

All figures are percentages

	1967	1973
All supermarkets over 2,000 ft <sup>2</sup>	100	100
Supermarkets 2,000 - 3,999 ft <sup>2</sup>	61.6	11.5
" 4,000 - 7,999 ft <sup>2</sup>	34.0	46.5
" 8,000 ft <sup>2</sup> and over	4.4	42.0
Supermarkets 4,000 ft <sup>2</sup> and over	38.4	88.5

Some of these large supermarkets, or "superstores", have been opened in non-traditional locations: away from normal shopping centres and into the suburbs or the periphery of towns. The size of the retail industry has grown generally in response to the continuous increase in both population and income per head over the years before 1975. But the changes outlined above have favoured the channeling of this growth into, in particular, large out- or edge-of-town "superstores". Town planners and conservative interests within the industry have tended to resist this trend.

A "superstore" may be defined as a retail outlet of between 10,000 and 25,000 ft<sup>2</sup> retail sales area,<sup>30</sup> selling a very large number of lines by self-service methods, the majority of

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<sup>29</sup> Sources: Self-service and Supermarket (1968); and SuperMarketing (18/1/74).

<sup>30</sup> Or, alternatively, between 20,000 ft<sup>2</sup> and 50,000 ft<sup>2</sup> of Gross Leasable Area (GLA), which in most practical cases will be equivalent.

whose trade is in food, under one roof and management, normally adjacent to its own car-park, and generally open until mid-evening<sup>31</sup> three or four days a week.

A superstore is a magnet in its own right, i.e. a high proportion of its trade is generated by the attraction of customers to the superstore itself, rather than passing trade. But it is not a hypermarket. These are defined in France as stores of over 2500m<sup>2</sup> (about 24,000 ft<sup>2</sup>) retail, and may be over 100,000 ft<sup>2</sup> retail.<sup>32</sup> (There are hardly any in Britain.) The demarcation line is arbitrary, but reflects the near-universal tendency of hypermarkets to be isolated units serving a subregional market, whereas superstores are more commonly the principal, but not the only, unit in a centre serving part of a city. An out-of-town 'Regional Shopping Centre' is a different type of development from both of these, designed to provide predominantly durable goods shopping for a very wide catchment. It may exceed a million square feet of Gross Leasable Area.

The Capital and Counties Property Company<sup>33</sup> has identified the reasons why out-of-town shopping is more prevalent in America than in Britain as: the ample supply of out of town land in North America; higher car ownership and hence a willingness to drive further; a climate which encourages enclosed and air-

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<sup>31</sup> In Britain, there are some archaic regulations which survived the abolition of other restrictive trade practices, that forbid shops to open after 8 p.m. or on Sundays for the sale of a now wholly arbitrary set of products. In France, the normal practice is for superstores and hypermarkets to open until 10 p.m. from Tuesdays to Fridays and to close all day Monday.

<sup>32</sup> Carrefour's Marseilles hypermarket is 220,000 ft<sup>2</sup> GLA.

<sup>33</sup> Source: Capital and Counties Property Company (1969).

conditioned centres; looser planning control; a level of affluence at which quality is more important than price; and lower residential densities, resulting in greater distances between homes and the city-centre.

Given these factors, it may be that the superstore is a compromise between traditional and out-of-town shopping locations which is in general appropriate to British conditions. This question is the subject of Part 2.

PART 2 : THE EDGE-OF-TOWN OPTION.Chapter 3.      Advantages for the Retailer.

The edge-of-town superstore's most vociferous advocates are the retailers.<sup>34</sup> They stress most strongly the savings in organisational costs. There are considerable economies of scale within the retailing industry generally, as well as particular opportunities which may be open to the purpose-built single-level freestanding superstore.

The first group of economies favour any large retailing enterprise, including the supermarket multiple,<sup>35</sup> by comparison with the small shopkeeper. They occur because of indivisibilities of people and of equipment, and because the balance of power between retailer and supplier varies with their relative size. Savings in stockholding, the cost of which decreases with increasing turnover, are an example of the former. Another is savings in staffing because staff time is not wasted during slack periods.<sup>36</sup> Staffing will also be more efficient in the larger enterprise because it can recruit and train its own labour and employ specialists such as buyers and accountants.

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<sup>34</sup> Notably Sainsbury's and Fine Fare. References to an example of each are given at note 22.

<sup>35</sup> See note 25 for definitions. Most edge-of-town superstores (and hypermarkets) are run by multiple enterprises, but normally each outlet is managerially independent.

<sup>36</sup> This is partly because labour can be used at such times for price-marking, restocking, etc; and partly because part-time labour can be used to cover the peaks. A shop which employs 30 people on Saturdays can hire 4 as part-timers if it requires only 26 on weekdays. But a shop which requires 3 people on Saturdays cannot employ only 2.6 during the week. Its 3 people will be less than fully employed.

The power of the larger retailer arises because he can determine his own retail prices and forecast sales; he has access to his own figures and market intelligence; he can cut out unprofitable lines; he can give large and regular orders to suppliers, and he can also withhold them.<sup>37</sup> "The advantages of the multiple stem largely from replacing market relationships by organisational ones".<sup>38</sup> The enterprise can buy direct from manufacturers, rather than from independent wholesalers. It minimises suppliers' planning and distribution costs. If therefore can obtain the most favourable discounts.

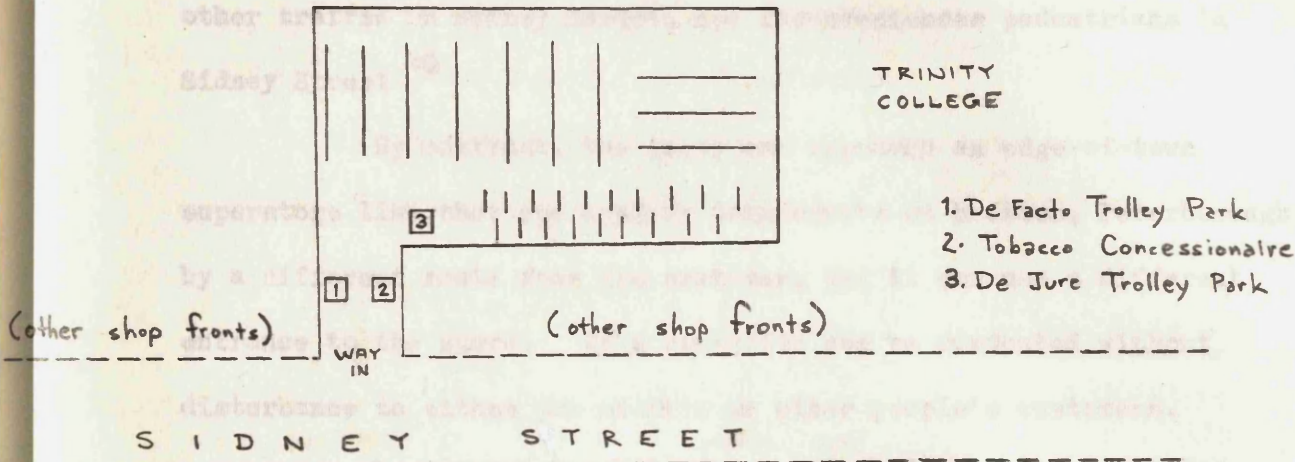
The further advantages of the edge- or out-of-town superstore can be summarised as the avoidance of internal and external congestion. The problem of internal congestion may be examined by reference to the new, purpose-built, 19-checkout Sainsbury's supermarket in the centre of Cambridge. Because street frontage is scarce, the sales area is L-shaped with a narrow entrance which is always crowded at busy shopping hours (Figure 2). Shortage of breadth in the store means that checkouts have to be double-ranked in order that the desired number may be accommodated. It also necessitates narrow aisles between display stands, barely giving room for two shoppers with trolleys to pass each other. This inevitably slows up the journey round the shop and inhibits the pause for thought and selection.

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37 Unless the goods in question are in monopolistic supply and the retailer judges it essential to stock them.

38 Source: McClelland (1966). Information in these paragraphs is derived from McClelland, and also from Fulop (1964).

Figure 2 - Layout of Cambridge Sainsbury's  
(diagrammatic)



Space, even behind the street frontage, is severely constrained by other existing properties (including Trinity College). The storeroom cannot, therefore, be alongside the sales area or even behind it; it has to be underneath. The time (and cost) of transfer of goods from storeroom to display stand is inevitably higher.<sup>39</sup> The general congestion in the shop also makes it more difficult to restock the sales area during trading hours.

Congestion outwith the building is a further constraint on the operation of transferring goods from depôt to display stand. They have to use smaller lorries for delivery because of the narrowness of streets, and the necessity to park in Sidney Street

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<sup>39</sup> Vertical transit is more difficult than horizontal.

and reverse into the storeroom entrance for delivery. This operation raises costs since deliveries must be more than optimally frequent. Moreover, it inconveniences Sainsbury's, inconveniences other traffic in Sidney Street, and inconveniences pedestrians in Sidney Street.<sup>40</sup>

By contrast, the lorry can approach an edge-of-town superstore like that operated by Sainsbury's at Bretton, Peterborough, by a different route from the customer, and it can use a different entrance to the store. This operation can be conducted without disturbance to either the store's or other people's customers.

Larger lorries deliver at more economic intervals and unload by forklift truck. Economy can be maximised "where manufacturers price-mark goods, so that large quantities can be wheeled into stores and left for customers to help themselves."<sup>18</sup> The removal of the space constraint enables the stocking operation to be conducted with maximum efficiency.

The other savings which a superstore may be able to obtain in comparison with a supermarket are organisational economies associated not with the size of firm or its location but with the size of outlet. These have been exposed at Public Inquiries into hypermarket applications. They were summarised in identical terms

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<sup>40</sup> Sources: information remembered from a paper given by T.A.D. Sainsbury to a conference at St. John's College, Cambridge, in November 1972, together with personal observation. The general validity of these experiences is supported by Gillian M. Pain who has devoted an entire book to the problems of delivery to in-town shops (Pain, 1967). He shows moreover that congestion may lead to restrictions on delivery times, thus complicating (and probably lengthening) the schedules of those who have to deliver to a number of outlets. See also Sainsbury (1972).



by G. R. Cyriax, a witness for Hypermarket (Holdings) Ltd., at the  
 Chandlers Ford Inquiry in Hampshire<sup>41</sup> and at the Cribbs Causeway  
 Inquiry in Avon<sup>42</sup> as:-

- "a) Savings in staff costs because of high sales per employee and control of all processes under one roof and management;
- b) the elimination of transport costs involved in warehousing off the premises, as would be necessary for a multiple operating a central stocking system;
- c) Savings in control and head office costs including the elimination of an entire stage of accounting and stock control."

It is difficult to quantify, or even to test the existence of, these savings without inside information. But some light can at least be shed on the alleged savings in staff costs.

At the Chandlers Ford Inquiry, Cyriax projected that the proposed 50,000 ft<sup>2</sup> (retail) hypermarket would employ 250 people. When it opened in 1974, the staff was 350.<sup>43</sup> This is an outturn of 143 ft<sup>2</sup> per employee, compared with a projection of 200 ft<sup>2</sup>. The 130,000 ft<sup>2</sup> Carrefour hypermarket at Villiers-en-Bière in France attains 217 ft<sup>2</sup>/employee.<sup>44</sup> Cyriax's projection for the 90,000 ft<sup>2</sup> proposal at Cribbs Causeway was 257 ft<sup>2</sup>/employee. It would be more cautious to scale this down to the 143 ft<sup>2</sup> obtained at Chandlers Ford. Accepting Cyriax's projection of turnover in 1976 at £8.6 million (at 1970 prices), the turnover per employee at that date would have been £13,650. This is only just over half Cyriax's own estimate

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<sup>41</sup> Source: Department of the Environment (1972).

<sup>42</sup> Source: Bristol (City) Planning Department Research Section (1972).

<sup>43</sup> Source: SuperMarketing (26/7/74).

<sup>44</sup> Source: National Chamber of Trade (1973).

(£24,570), but is more than twice the average turnover per employee. Converting the Census of Distribution to 1970 prices, this was £6,731 in 1971.<sup>45</sup>

Cyriax is likely to have sought to minimise rather than to maximise the projections of turnover, in order to minimise the fears of his hypermarket. Therefore it is reasonable to assume that the difference between £13,650 and £6,731 is not dominated by error in estimation. In terms of staff per £ of turnover, it does appear that the hypermarket is very substantially more efficient than the average multiple shop.

It is curious that Cyriax does not claim savings in land costs. Tanburn<sup>18</sup> observes that for out-of-town stores in the E.E.C. "their buildings and fittings can be cheaper, as also will be their rent and rates." But this general statement is actually countered by Cyriax<sup>42</sup> who states that "cheap occupancy as against the U.K. multiples would not form a significant source of advantage in the economics of a hypermarket." He attributes this to the high standards of amenity (e.g. airconditioning), the cost of land for carparking, and the favourable terms often negotiated for ordinary supermarkets by the multiples. Since the superstore compound occupies more land for a given sales area than the supermarket, the savings flow not from the cost of land but from the greater availability of space.<sup>46</sup>

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<sup>45</sup> Source: Department of Trade & Industry (1972/3). The figure for supermarkets alone is higher, but still well below £13,650: probably about £9,600.

<sup>46</sup> It does not follow that the superstore is indifferent to the cost of land. Even if it could assemble at an in-town location the area of land equivalent to that acquired for an edge-of-town superstore, it would be more expensive - probably prohibitively so - as well as likely to break up the frontage of the High Street.

How far the savings indicated above operate in favour of the edge-of-town superstore as well as the hypermarket is an open question. Those associated with uncongested location obviously do. The extent to which the superstore can gain the organisational advantages is less certain. How the savings that do apply are divided between retailers' profit and better values for customers is a separate question, discussed in Chapter 4.

Chapter 4.      Advantages for the Customer.

The Inspector's Report at Chandlers Ford<sup>41</sup> said that "there is a direct connection between the success of the free-standing superstores and the extent to which they were able to give the consumer the economies derived from this methods of operation in the form of discounted prices." Chapter 3 has examined the two factors which combine to make this possible: greater turnover per square foot (per annum), and lower costs per £ of turnover. The result is lower gross margins.

At Villiers-en-Bière, gross margins were reported as 5% for dry good, 8-10% for fresh food, and 20-25% for non-food.<sup>44</sup> For the Chandlers Ford Inquiry,<sup>41</sup> Cyriax estimated an average of 12.5% overall, including 21% on non-food. These two similar estimates compare favourably with the 28-35% on non-food for British department stores suggested by Cyriax. There is also a significant paring of the margin compared with the 24-26% range which was found by the Price Commission to operate amongst fruit and vegetable retailers in 1972.<sup>47</sup> On this evidence, the superstore is in a good position to undercut its competitors.

There is some consistency in the evidence of lower prices in hypermarkets. Cyriax argues<sup>41,42</sup> that food prices would be lower by 7% and non-food by 9-9½%. At Villiers-en-Bière, "pricing policy was said to aim at an average level of about 10% below other retail outlets."<sup>44</sup> When the Chandlers

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<sup>47</sup> Source: SuperMarketing (1/11/74).

Ford store opened, prices were found to be about 10% below the Financial Times shopping basket.<sup>43</sup> A few months later,<sup>48</sup> SuperMarketing magazine observed that "in their monitor of prices in the South of England, Carrefour heads a list of twenty retailers with a total price of £37.50<sup>1</sup>/<sub>2</sub>p for the 103 items included. This compares with £39.25<sup>1</sup>/<sub>2</sub>p for Sainsbury's who are placed number two, and £41.42<sup>1</sup>/<sub>2</sub>p for Budgen's at the bottom of the list. Average price was around £40.10p." Therefore, Carrefour is over 6% cheaper than the average.

The reporter at Villiers-en-Bière<sup>44</sup> did caution that "some members of the public indicated ..... that to benefit from the lower prices it was necessary to predetermine one's requirements and resist the temptation to buy anything else." Nevertheless, the price savings attributed to hypermarkets do appear to exist in fact. They are an essential influence on one's judgement of them, and it is unacceptable to follow the example of Hampshire County Council who said at the Chandlers Ford Inquiry<sup>41</sup> that "the forecasts made of price savings are not a matter for consideration by the Authority."

I have collected some evidence on prices, however, which is less favourable to the superstore. I visited on two successive days in November, 1974, the Cambridge Sainsbury's discussed in Chapter 3 and their edge-of-town store at Bretton, Peterborough,<sup>49</sup> and I compared the prices of 66 similar items (Table 7).

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48 Source: SuperMarketing (18/10/74) The 'South of England' is south of a line from Swansea (!) to the Wash.

49 The comparison therefore standardises for (a) date (b) organisation and (c) modernity of store, both being purpose-built and at the time both had been open for about two years. The differences between the two stores should therefore be entirely attributable to the effects of size, location, and competitive position - unless there is cross-subsidisation within the firm. The Bretton store is 54,000 ft<sup>2</sup> retail according to Eve (1971).

Peterborough's advantage is marginal:-

Table 7 : Sainsbury's Relative Prices.

	Number of items	% of items
Cheaper in Peterborough	8	12
Cheaper in Cambridge	4	6
The same price in both	54	82

The small number of price cuts at Bretton may be due to the strength of Sainsbury's competitive position there. Before they agreed to go to Bretton, Sainsbury's received an assurance that no other supermarket would be allowed to locate in the neighbourhood. Sainsbury's therefore has a degree of local monopoly not enjoyed by its Cambridge brother. As Sainsbury's themselves argue, though, the car-borne shopper (to whom the Bretton store is geared) is highly mobile, and the presence of two or more edge-of-town centres in a city should be sufficient to ensure competition for the key marginal customers.<sup>50</sup>

This is more likely to be achieved with superstore-anchored district centres than with larger hypermarkets, although even a hypermarket does not put all its competitors out of business. It is too early to draw conclusive judgments in the British context, but the first evidence is that "at Caerphilly, the hypermarket

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<sup>50</sup> Bretton is something of a pioneer store and as yet there are no other superstores in Peterborough. Competition within the superstore sector of the industry is important because the proportion of the custom that is 'captive' by virtue of the store being the only one that it is convenient to walk to is less than for the traditional suburban supermarket. Cambridge is unusual in the high residential population within walking distance of the city-centre.

probably closed down two supermarkets, a fruit and vegetable shop, and a wet fish shop ..... [but] there had never been more applications for shopfronts from local shopkeepers than since Carrefour had opened."<sup>51</sup> Neither superstore nor hypermarket simply provides 'the same only cheaper' in competition with the traditional convenience<sup>52</sup> shops near the customers' homes.

Indeed, the Bretton evidence is that the superstore is more likely to be 'the same price, but more': more goods, more lines, and larger units. Of the six goods I compared, the edge-of-town store had more than 50% more lines than Cambridge in three cases, and in only one case were there (marginally) less.<sup>53</sup> It also usually had larger size units than Cambridge in any particular brand. Bretton has a significant range of household accessories not available at the Cambridge store. The display of goods is more spacious than in Sidney Street. And because there are more checkouts (24 rather than 19) there is less queueing at them. So, as one Brettonian put it, 'You can get it cheaper in town, but Sainsbury's is convenient and it has everything.'

The edge-of-town store 'has everything' because it serves a wider-than-local market. Who are the non-local customers? The retailers claim that they are people who like to come by car, often in the evening, and buy in bulk. They take advantage of the facility to buy most or all of their shopping in one store and

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51 Source: SuperMarketing (20/9/74).

52 About  $\frac{2}{3}$  of most superstores' sales will be in the convenience trades, and little of their comparison goods sales will be generative trade.

53 An index for the number of lines at Bretton (Cambridge = 100) reads: Biscuits 171, Bacon 157, Cheese 153, Breakfast Cereals 123, Butter 100, Margarine 87.

wheel it in one trolley to the boot of the car. "The average weight of the purchases of the car customer is 30 lb, and the weekend buying is often twice as heavy."<sup>54</sup> Generous carparking provision is standard practice at hypermarkets and superstores.

So too is late opening. Carrefour believe that "with the extended hours of opening in a Carrefour store, the housewife is able to shop in the evening with her husband, perhaps having a meal in the restaurant where one is provided in the store, and secure all the everyday needs of her family in a shorter time and without the fatigue of having to walk around the town calling at several shops in order to make her purchases."<sup>41</sup> They said that in France, 40% of their trade is after 5 p.m. This cannot be achieved in Britain,<sup>31</sup> but at Chandlers Ford they do operate the latest opening hours the law allows: 9 a.m. to 8 p.m. on Tuesdays to Saturdays and to 9 p.m. on Fridays.<sup>55</sup>

The non-local customers are, of course, also attracted by the features which the edge-of-town store shares with the super-market. According to a National Board for Prices and Incomes Board Report,<sup>6</sup> housewives like the spaciousness, the wide choice of brands, the clear display of products and prices, the lower prices, and the cleanliness, which they associate with supermarkets. All these features ought to be all the more pronounced in a super-store.

The presence and importance of these characteristics was tested by a survey in Aberdeen.<sup>24</sup> Fine Fare sampled the

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<sup>54</sup> Source: Sainsbury (1972).

<sup>55</sup> Source: SuperMarketing (26/7/74).



customers at their 40,000 ft<sup>2</sup> retail<sup>56</sup> superstore at Bridge of Dee, Aberdeen. The 'Features of the Superstore' mentioned favourably are listed in Table 8. This shows some parallel with

Table 8 : Features of Fine Fare at Bridge of Dee

Feature	% mentioning the feature
Variety of displays	68
Parking facilities	65
Food hall	54
Opening hours	40
Location at the edge-of-town	35
General atmosphere and service	28
Free bus-service	10

the factors mentioned in the preceding paragraph, with the notable exception of 'lower prices'. Clearly, however, transport convenience is also very important, being highlighted by three-quarters of the sample. Parking is mentioned by 65%, nearly as great a proportion as came by car (see Table 9), whilst the free bus<sup>57</sup> was exemplified by more people than actually used it!

The importance even to local users of the superstore's convenience for the car driver can be derived from Table 9. The

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<sup>56</sup> Source: Eve (1971).

<sup>57</sup> A free bus is provided by Fine Fare at the request of the City Council (the Planning Authority), so that the store is accessible to certain parts of the city whose residents could not easily get there by public transport.

Table 9 : Usage of Fine Fare at Bridge of Dee.

Catchment Area:	Distance of homes from superstore (miles)	% of total trade
	0 - 1	42
	1 - 2	14
	2 - 3	18
	3 - 10	17
Mode of travel:	10	9
		% of customers
	Walk	11
	Car	72
	Fine Fare bus	6
Type of shoppers:	Public transport	11
	% of Grampian Region's population	% of customers
Aged 25-44	24	52
Socioeconomic classes ABC <sub>1</sub>	32½	41

superstore relies markedly more heavily than does a conventional district centre on shoppers coming from more than a mile away,<sup>58</sup> but the propensity to come by car is even more noticeable.<sup>59</sup> Even if all the walkers and half the bus-passengers come less than one mile, a majority of local trade is with car-drivers. This is partly

58 The three district centres in Exeter, for example, attract 17%, 20%, and 40% of their trade from more than one mile away, compared with 58% in Table 9. Source: Department of Geography, St. David's University College, Lampeter (1974). 'Local' in this paragraph means within one mile radius.

59 Table 9's 72% compares with 19%, 20%, and 41% for the Exeter centres. Source: Ibid.

because the customers tend to be disproportionately from the higher socioeconomic groups and the younger-middle age group, both of which are more likely to be car-drivers. But the implication is that the superstore has substantial appeal expressly for those who are able and willing to use a car.

It is therefore necessary to consider next the impact of this appeal on those who are affected by a superstore other than as vendors and purchasers.

Chapter 5.      External Effects.

There are impacts of any shopping development beyond those on the developer, his tenants and their customers. In Britain, any such development requires planning-permission. The local planning authority is therefore in a position to take the wider considerations into account before giving its approval. Whilst each case is unique, many of these considerations will be similar in a wide variety of situations where a proposal is made to develop an edge-of-town District Shopping Centre.

Amongst these is the direct effect on the overall pattern of shopping in the district. Chapter 7 analyses a number of techniques for assessing whether the extra capacity which would be created by a proposed development is required. The principle was stated by Roger Tym<sup>60</sup>:

"There should be a demonstrable need for more floor-space ..... [which] results from a surplus of trade over and above that which ought reasonably to be differentiated from the concept of demand which .... expresses a simple entrepreneurial desire to create more retail floorspace for financial gain."

The phrase 'ought reasonably' is indicative of the flexibility of the 'capacity' of existing floorspace, and developers are (of course) capable of making a profit - at the expense of existing shops - from new development before that capacity zone has been reached. But as a general rule, the greater the projected

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60 Source: Tym (1973). My underlining. Tym was speaking as a witness for Ravenscroft Properties Ltd., who are not unknown for their "entrepreneurial desire .....".

growth rates of car ownership, population, and per capita income,<sup>61</sup> in the district, the more likely it is that a new district centre will be 'needed'.

If this criterion is satisfied by a proposal, the next consideration is whether in the context of subregional shopping policy the location is desirable. It may be, for example, that a landowner is seeking to develop the site which he owns. The development will provide him with a satisfactory return on his investment. But the population would be better served if a centre were constructed half a mile away. Or, in a wider perspective, the local authority may consider that the required increase in shopping capacity can be provided better by redevelopment of existing centres than by new development. In this situation, both to approve of new development and to maintain a policy of redevelopment might - indeed, if the latter policy were well devised, would - lead to a waste of resources.

Alternatively, the Authority may decide to abandon its previous policy on the grounds that the proposed new development is more beneficial than what it had planned. Again, in some cases the proposal may square well with existing policy. An edge-of-town district centre application is most likely to be acceptable for this reason where "the extent of shopping, parking and accessibility is inadequate, inconvenient, and incapable of easy improvement."<sup>62</sup>

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61 The identification of the major variables relevant to shopping policy analysis as being increasing wealth, increasing population, changing travel habits, and changing retailing methods was made by the 'Haydock Report' (Department of Town and Country Planning, University of Manchester. 1964). It has since reappeared in different words in many places and must be presumed to be part of conventional planning wisdom.

62 Source: Mansley (1971).

Where there is a prima facie case for a proposed centre, its effect on other centres should be estimated.<sup>63</sup> The developer may share Philip's argument<sup>64</sup> that the city-centre will not suffer: "What will happen? Speciality shops will flourish. Luxury department stores will flourish. There will be room for other essential functions such as council and administrative offices, and intellectual activities : museums, theatres, libraries, etcetera. You will upgrade your city-centre."

The planning authority may be less optimistic. Forbye, if this happens the convenience goods service for those who live near the city-centre will be curtailed. Furthermore, such a curtailment will be distributionally regressive if central area residents are poorer than the citizenry as a whole, or than the customers of the new centre in particular, especially since convenience shopping is more important for the poor than for the rich.<sup>65</sup> It is an inequitable shopping policy that seeks to force the poor to eat furniture.

The effect on other centres may also be negative. Increased competition may lead to oligopoly, resulting in higher profits but no benefit to the consumer. On the other hand, it may induce price-cutting or an improved quality of service. A judgment must be made in each local situation.

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<sup>63</sup> This is especially important where no shopping policy exists. This is all too common even in Scotland where S.D.D. circular 43/71 (Scottish Development Department:1971) requests all local authorities to formulate one.

<sup>64</sup> Source: Corporation of Glasgow Planning Department (Ed) (1971).

<sup>65</sup> According to the 1972 Family Expenditure Survey (Department of Employment 1973), Chart 1, for households with an income of less than £15 per week food accounts for 32% of expenditure and durable household goods for 4%. These proportions respectively decline and rise progressively to 22% on food and 8% on durable household goods for households whose weekly income is £60 or more.

Forbye its shopping policy, the planning authority should be concerned about the general planning implications of the proposed development. A major consideration should be the alternative use to which the land might be put. Edge-of-townland may be lying idle; but it may be regarded as important for recreational or industrial use. It does not follow that a shopping centre is never the optimal use for land which is also suitable for some other purpose.

For example, at Chandlers Ford<sup>41</sup> a hypermarket application was approved by the Secretary of State although he noted that "the site has been proposed for inclusion in the green-belt". No doubt the possibility of a hypermarket had not been considered by those who proposed it for inclusion in the greenbelt.

Fulop<sup>66</sup> makes the sweeping statement that "space near industrial centres is too valuable to be used for parking". Baillie,<sup>67</sup> equally unconditionally, proclaims that "prime industrial sites adjacent to the road network should not be allowed to be developed for commercial purposes". They both show scant regard for the possibility that around some cities the supply of land suitable for industry may exceed the demand for it. Clearly, nevertheless, the greater the potential of a site for uses other than shopping, the greater its 'opportunity cost'<sup>68</sup> in shopping use and therefore the greater the weight which the local authority ought to attach to the alternative foregone.

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<sup>66</sup> Source: Fulop (1964)

<sup>67</sup> Source: Baillie (1972)

<sup>68</sup> The 'opportunity cost' of a site is its value in the most valuable alternative use foregone.

The authority may need to consider not only the actual site on which it is proposed to build a shopping centre but also adjacent land. It may wish to ensure that a precedent for further urban development in the neighbourhood is avoided. Hence, the development of a greenfield site may be less favoured than "a well-planned district centre within or on the edges of the built-up area"<sup>69</sup> which is complementary to nearby land uses. The Scottish Development Department suggest that local authorities may prefer to use their powers of land acquisition and assembly, rather than to wait for a speculative application, in order to ensure that development is well located in planning terms.

S.D.D.'s<sup>69</sup> concept of the latter is that "development of out-of-town shopping sites may be encouraged if they are sites which offer good access, which are appropriate for the full range of commercial and social provision of a district centre, and which are open to no major objection on amenity or other grounds."

Good access should, in planning terms, include access by public transport. "Many people using the existing town and district centres will remain dependent on public transport for themselves, their children, and their goods - a service which it may not be possible to provide to isolated out-of-town locations though it can sometimes with advantage be made available to a well-planned district centre."<sup>69</sup> The Wester Hailes district centre in Edinburgh, albeit a relatively conventional development, is a good example of a well-serviced centre. It is on at least four bus routes.

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<sup>69</sup> Source: Scottish Development Department (1971).



Accessibility by bus is likely to be particularly important to lower income groups. They are less likely to have access to a car for shopping than the higher income groups. Moreover, McRobert<sup>64</sup> contends that mail-order would be the chief sufferer from non-central area developments. It happens that the use of mail order ranges from 71% of social class 5 down to 38% of classes 1 and 2.<sup>64</sup>

Possible objections on amenity grounds, apart from detailed questions of design and layout, include visual intrusion, noise, dirt, fumes and traffic. These grounds may be relevant whether the neighbourhood is residential or open country, although they may in either case be overcome by adequate barriers against sight, sound or smell as the case may be.

'Other' grounds include the possibility that any gain in rateable value to the authority from the proposed centre will be more than offset elsewhere. This is unlikely where the development is adjudged desirable on shopping policy criteria. It has also been argued<sup>70</sup> that they should include the possibility of a decrease in demand for existing cultural, social, welfare, parking, and highway facilities: the investment in them would be 'wasted'.

This argument is spurious. The marginal cost of reducing usage of investment that has already been made is zero, for the capital expenditure is irrecoverable. There may in fact be a saving: from lower maintenance costs. Where a real resource cost would exist is if any of these services have to be duplicated

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70 For example, on behalf of Bristol Corporation at the Cribbs Causeway Inquiry. Source: Bristol (City) Planning Department Research Section (1972).

in consequence of the opening of the new centre, or if capital expenditure which would not otherwise be incurred is required for the provision of utilities. Similarly, extra current expenditure may be necessitated on such services as refuse collection, lighting, policing, highway maintenance, and public transport.

Of all forms of development, the greenfield site out-of-town hypermarket is likely to generate the most expenditure by the local authority on real resources for some or all of these purposes. The in-town redevelopment of an existing centre is likely to be the most economical in this respect. The edge-of-town district centre is likely to fall between these two extremes.

The largest element of the costs imposed on the community by any substantial development, which the planning authority ought to take into account before approving an edge-of-town district shopping centre application, remains to be discussed: the traffic that it would generate, in relation to the capacity of the roads affected.

A new shopping centre is unlikely to donate to the city the external benefit of an improved traffic flow in a location away from itself. Any reduction in traffic will be slight, chiefly because shoppers are a small proportion of in-town traffic.<sup>71</sup> The external costs, though, may be significant. In the neighbourhood of a new development new access points to major roads may be required. The volume of traffic on both minor and

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<sup>71</sup> This argument was developed by Clemens of Drivers Jones at the Cribbs Causeway Inquiry. Source: *ibid*.

major roads will be increased. It is the impact on major roads which is most likely to vary amongst alternative locations for new development, since some roads are more congested than others.

In terms of peak demand, shopping traffic is not necessarily material, for the shopper-traffic peak is not coincident with the journey-to-work peak. If the peak is raised, it will be in the hour 5-6 p.m. on the Friday before Christmas.<sup>72</sup> But if the use of a road is predicted to be near its capacity without a shopping centre, the centre might add sufficient traffic to overload the road at peak hours. Besides, in the vicinity of the centre, the extra traffic may be a substantial proportion of total traffic - especially if the centre be built in an area of otherwise low intensity of land use.

The peak is not the only time when the addition to load is important. A road is not like an electricity supply system. All that happens if the volume of traffic exceeds the design capacity is that average speeds are reduced. This may be adjudged acceptable for one hour a week, provided that the traffic moves smoothly at other times.

An indication of the volume of traffic involved was given by Freeman Fox<sup>42</sup>. A 50,000 ft<sup>2</sup> retail edge-of-town district centre would be expected to generate about 325 cars travelling into, and a similar number out of, the centre between 11 and 12 a.m. on an average Friday. This is more than twice the traffic at a conventional

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<sup>72</sup> c.f. figures at the Chandlers Ford Inquiry. Source: Department of the Environment (1972). Perhaps it would be half an hour earlier in Scotland.

centre. (This excludes heavy vehicle delivery traffic since the centre should normally be designed so that this uses different approach roads.<sup>73</sup>)

It is part of the merits of a particular application whether the approach roads can readily accommodate a volume of movement of this order of magnitude. If new roadbuilding is required, this is one of the extra services whose cost to the local authority will be considered by it in relation to the shopping centre application.

A good summary of the criteria by which one authority judged applications for planning permission for shopping development is quoted by Tanburn.<sup>18</sup> At the I.P.S. Conference in 1971, J. Rowbotham of Lancashire County Council indicated their criteria, in no particular order, as: road communications; amenity of nearby residents (traffic, noise, smell, privacy, litter); impact on other shopping outlets; effect on the town-centre; the detailed plans; and the extra public expenditure involved.

Tanburn comments that "these criteria ..... are nicely balanced", but they emphasise technical rather than welfare considerations, and they give the impression that each application is treated in isolation, rather than as an alternative to other means of providing shopping facilities and in the context of a subregional shopping policy. Rowbotham's criteria would be likely to overlook, or miscalculate, the opportunity presented by an application for a superstore-anchored edge-of-town district centre

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<sup>73</sup> c.f. above, page 23.

in an area where new residential development was going to take place after its completion.

Chapter 6.      A Special Case : Areas of New Residential Development.

The first comers to any new residential area are at a disadvantage compared with later arrivals. It is debateable how far early residents should have to pay costs not shared by later migrants, viz. the costs of moving to, at the time of the move, an area of low population. The issue is most sharply focussed when the move is involuntary, e.g. caused by redevelopment. "Residents will initially be faced with a strange living environment and few social or community facilities"<sup>74</sup> and with poor access to larger centres. In respect of shopping, residents of Livingston New Town, for example, complained of high prices and an absence of large multiple stores. Taylor suggests that the shops are the second most important part of the environment for the housewife after the home. If so, a poor quality of shopping facilities is a social as well as an economic problem.

Should the Authorities, therefore, subsidise shops to locate in the new scheme; or alternatively should buses be subsidised to transport shoppers to the nearest established shopping centre? The former argument has been advocated on the grounds that a new centre "is certain to be a viable proposition in the not so long run".<sup>75</sup>

The simplest procedure would be to subsidise rents (as with offices), but Taylor<sup>74</sup> recommends a different form of subsidy. The Authorities would pay "the shortfall between profits

<sup>74</sup> Source: Taylor (1974).

<sup>75</sup> Source: Diamond and Gibb (1966).

expected from trading at the normal threshold level and those actually earned at the lower population/demand level" - but to one or two major retailers only. If the shortfall were measured against 'profits expected at the lower population/demand level', and these were calculated on the same basis as 'profits expected from trading at the normal threshold level', the scheme would be similar to the pre-E.E.C. agricultural support system. That guaranteed to every farmer marketing a particular commodity the difference between an agreed price and the average market price, irrespective of the price he himself obtained in the market.

Such a scheme would probably be feasible and fairly inexpensive for the Exchequer. But it would give the favoured traders an unearned competitive advantage both over their national rivals and over other outlets in the area. It would be difficult to create an equitable basis for tenant selection: in contrast to industry, the number of firms eligible for subsidy would be less than the number seeking to claim it. The assumption would need to be made that these disadvantages, and the public expenditure involved, would be outweighed by the social benefits.

These problems can be circumvented if an edge-of-town district shopping centre is located in what would otherwise have been the neighbourhood centre of an area of new residential development, and a superstore commences trading there in advance of the arrival of the occupants of most or all of the new houses. This was the case with Sainsbury's at Bretton, Peterborough Expanding Town.

In effect, what is obtained is a substantial gain to a small number of people in the first year of trading, diminishing to a smaller gain for a larger number of people each year until the population reaches its target and the scheme is completed. The price is at most a small loss to a large number of people resident in the district as a whole. Also, the retailers trading in the new centre may sacrifice a level of profits in the first years of operation for the security of an assured growth in their market. This derives from the increase in a population almost attached to that centre over the following years.

The gain to the early residents in the scheme derives from their accessibility to the higher-order facility of the superstore (and any complementary shops that open in the centre) at a time when they themselves constitute a small proportion of its customers. The loss is in the catchment area of the superstore and follows the diversion of trade to it. The level of provision in the affected area will be lower than it would have been without the superstore. Shopkeepers suffer. So too do those residents who would not have preferred to use the superstore.

But provided that the diverted trade is not drawn away intensively from any one geographical area, no one consumer will suffer any marked diminution in the facilities accessible to him. This proviso will be valid if the zones 5-10 minutes' and 10-15 minutes' drive away from the superstore both cover several built-up neighbourhoods. (It is assumed that the 0-5 minutes'



drive zone consists of the new scheme.)

Where the conditions obtain, the commercial viability of the superstore is reinforced by welfare considerations. There is therefore a planning case, in cities where population is increasing or decentralising, for the steering of superstore development to the areas of impending residential expansion. Clearly, there is a limit to the possibilities for such action: one cannot expect retailers to tenant two superstores in two neighbourhoods unless they are at least about half an hour's drive away from each other. But one can plan to benefit one of the neighbourhoods in this way.

PART 3 : THE ASSESSMENT OF A PROPOSED SHOPPING INVESTMENT.

Chapter 7.      Theoretical Analysis.

The decision to build new shopping floorspace is a decision to undertake investment in real fixed capital assets. Capital investment theory can therefore be adapted to indicate elements of the basis on which these decisions are taken.

Knox<sup>76</sup> assumes that there is a fixed connection between the current annual increment of capital stock and the current rise in final output. He later modifies this to allow for an investment gestation period<sup>77</sup> and for fluctuations in demand. He retains the principle that the dominant determinant of the decision whether to invest in the capacity to produce a good is expectations of demand for that good. Factors such as lags, uncertainties, indivisibilities, and, in the case of an individual nonmonopolistic firm, competition are subsidiary considerations.

In the shopping context, this means that the incentive to invest in new floorspace derives from a sustained increase in demand within the catchment area for the goods to be sold in that floorspace; and hence the prospect of an expansion in total turnover. The possibility that an increase in turnover over the next, say, five years will be followed by a decrease over the following five is excluded from consideration: it is assumed that if the turnover in future year  $t_a$  is projected to exceed turnover in the

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<sup>76</sup> Source: Knox (1952).

<sup>77</sup> An 'investment gestation period' pertains to the time between the decision to invest and the coming into service of the investment. For example, the Chandlers Ford hypermarket opened about three years after the Public Inquiry and eight years after the most up-to-date data thereat.

current year  $t_0$ , then turnover in all subsequent years  $t_{a+1}$ ,  $t_{a+2}$ , ...,  $t_{a+n}$  will be at least equal to that in year  $t_a$ .

Given this assumption, the determination of the return on an investment made in year  $t_0$  requires only an estimate of turnover in year  $t_a$ , the year of opening. The theoretical need to know turnover in all years of operation,  $t_{a+1}$ ,  $t_{a+2}$ , ...,  $t_{a+n}$  is overcome. Even the estimate for  $t_a$  is, of course, uncertain, for changes in such factors as population, personal incomes, and proportion of income spent in shops, are imprecisely predictable; but the return on capital that an investor requires before he will proceed with an investment allows a margin for uncertainty.<sup>78</sup>

In general terms, investment is justified when the cost of meeting the extra demand from existing fixed capital resources is greater than the average operating cost of (existing plus new) fixed capital plus the costs of purchasing and installing the new assets. So, if overall average costs can be lowered by increasing the floorspace available, then existing floorspace is being used above capacity. There is no fixed physical capacity of shop buildings. Such adjustments as a change in the lines sold, longer queues, or introduction of self-service, can alter the physical capacity of a given area of floorspace. But in economists' terms, capacity is the point of minimum average cost.

The amount of new building generated by any given prediction of probable turnover will vary with the existing floor-

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<sup>78</sup> In that, *ceteris paribus*, it would be greater than the return on a safe 'investment' in government bonds. *Ceteris* (i.e. capital growth prospects) are in fact not *paribus*.

space available to the assumed customers of the potential new building: its location, its capacity, and its current rate of usage. The location of any new investment will vary according to the spatial relationship between the origins of the extra demand for which the investment is designed to cater and the destinations to which it will be attracted in the absence of that investment.

Given predictions of the numbers of people who will be located in relevant spatial zones, of their expenditure in shops, and of their propensity to travel, the shopping policy planner<sup>79</sup> can estimate how that expenditure will be distributed amongst existing outlets on the assumption of nil investment. If gross system costs (to customers, transporters and traders) would be reduced by creating new outlets, then that investment is economically advantageous even if it involves closing existing outlets.

This holds even if total demand is not rising to exceed the capacity of existing investment. This is by virtue of the existence of technical progress and of finite transport costs. Technical progress means that a network of outlets (a,b,c,d,e), each operating at minimum average cost, should be replaced by a network (a,b,c,e,f) when the present value of the average running cost per £ of turnover of the new shop unit (f) is less than that of the scrapped unit (d)<sup>80</sup>, and the difference

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79 This analysis is translated from that of the electricity supply industry (Source: Turvey, 1968) in which there is a State monopoly. Its greatest relevance in the shopping context is therefore to the shopping policy planner, rather than to the investor to whom costs to competitors are an advantage not a disadvantage and total system costs, as such, irrelevant.

80 If (d) has any scrap value, this should be subtracted from the capital costs of (f), to give a value for net fixed capital formation.

exceeds the present value of the capital costs of (f): even if demand is constant.

Finite transport costs justify the same investment in response to a change in the location of the population, again independent of any change in its numbers or expenditure. They mean that there must exist a relationship between the spatial distribution of demand for shopping facilities (customers' points of origin weighted by their expenditure) and that of supply (shops). It is the rôle of shopping models to construct a theoretical description of the nature of this relationship in the general case. Models express mathematically the theoretical interaction between pertinent variables. Given a set of assumptions about the future behaviour of its parameters, a model will predict the optimum future distribution of shops.

Common sense led to the hypothesis that the attractiveness of a shopping centre is always a function of its size and its accessibility. Though refined, this principle of attraction (bigger is better) and deterrence (further is worse) has not been rejected. Originally formulated algebraically by Reilly in 1929<sup>81</sup>, the 'Gravity model' was modified by Converse who published in 1949 the formula:-

$$D_b = \frac{D_{ab}}{1 + \sqrt{\pi_a \pi_b}}$$

where  $D_b$  is the line of indifference between centre a and centre b;

$D_{ab}$  is the number of miles from a to b;

$\pi_a$  is the population of area a;<sup>82</sup>

$\pi_b$  is the population of area b.

<sup>81</sup> Source: Huff (1964)

<sup>82</sup> The notation has occasionally been altered here from that in the source publication lest the same symbol represent two or more different phenomena in different paragraphs of this chapter.

This formula is subject to major limitations. It can only be used where only two centres are in competition. It presumes the existence of zones all of whose populations go to one centre, or the other, with a watershed between them. Its input variables are somewhat rudimentary proxies for the behavioural influences on customers: deterrence may not be a straight-line function of distance in miles; and attraction may not be a smooth function of residential population to the power  $\frac{1}{2}$ .

These objections are accommodated by Huff, who published in 1964<sup>81</sup> a model which expresses the probability<sup>14</sup> that an individual consumer will shop in one of (any) number of competing centres:-

$$P_{ij} = \frac{F_j / T_{ij}^\lambda}{\sum_{j=1}^n F_j / T_{ij}^\lambda}$$

where  $P_{ij}$  is the probability that a consumer, point of origin  $i$ , will travel to centre  $j$ ;

$F_j$  is the size of centre  $j$ , in terms of  $ft^2$  devoted to the sale of the class of goods under investigation;

$T_{ij}$  is the time taken to travel from  $i$  to  $j$ ;

$\lambda$  is an exponent reflecting the deterrent effect of time.

In the Huff model, the proxy for the overall perceived cost of going to<sup>83</sup> the centre is travel time, rather than distance; and the assumption in Reilly's 'Law' of a square, rather than any other, root is waived in favour of a parameter  $\lambda$  whose value has to be empirically determined. Huff argues that  $\lambda$  varies between about

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<sup>83</sup> Such models imply an assumption that a shopping trip is a round trip:  $i$  to  $j$  to  $i$ . People, however, may for example shop on the way to collect the children from school, in which case the journey is  $i$  to  $j$  to  $k$ . In these situations, it is more important whether  $j$  is on or off the route from  $i$  (home) to  $k$  (school) than how far from  $i$  it is.

2.7 for furniture trips and about 3.2 for clothing. Six English studies<sup>84</sup> give values ranging from 1.3 to 2.6. However, one of the limitations of this model derives from the doubt whether there is any theoretically 'correct' value for  $\lambda$  which has general applicability.

The proxy for the opportunity provided by a centre is floorspace. This is more relevant than population, but it does not take account of factors such as prices and modernity which may be crucial to the success of an edge-of-town district centre. In comparison with the index of magnets<sup>85</sup> devised by the Haydock study,<sup>86</sup> it has the merit of being independent of the acceptability of specific firms in the study area, but the disadvantage of being affected by the dependent variable: viz. the floorspace in centre  $j$  is a determinant of the probability of customer  $i$  using centre  $j$ , but is determined by the sum of the probabilities for all  $i$  of customers  $i$  using centre  $j$  !

Nevertheless, floorspace is the normal proxy for attractiveness. This is at least partly because the objective of modelling is often to discover the optimum floorspace provision at a particular centre,  $j$ . For this purpose, the Huff model has been realigned so that  $S_j$  - expenditure in centre  $j$  - is the dependent variable. The reframed formula is the Lakshmanan-Hansen model:-

84 Source: Batty and Sæther (1972).

85 A 'magnet' is a shop that generates trade, e.g. Sainsbury's in south-east England or Templeton's in Scotland.

86 Source: Department of Town and Country Planning, University of Manchester (1964).

$$S_{ij} = E_i \frac{F_j^\alpha / T_{ij}^\beta}{\sum_{j=1}^n (F_j^\alpha / T_{ij}^\beta)} \quad \text{provided that} \quad \sum_j S_j = \sum_i E_i$$

where  $S_{ij}$  is the expenditure in centre  $j$  by residents of zone  $i$  ;  
 $S_j$  is the expenditure in centre  $j$  ;  
 $E_i$  is the expenditure by residents of zone  $i$  ;  
 $F_j$  is the floorspace in centre  $j$  ;  
 $T_{ij}$  is the cost of travel from zone  $i$  to centre  $j$  ;  
 $\alpha$  and  $\beta$  are parameters whose value must be empirically determined.

To determine  $S_j$  for any given  $j$ , the formula  $\sum_i S_{ij} = S_j$  can logically be derived from the above.  $\sum_i S_{ij}$  is the sum of the outcomes of the Lakshmanan-Hansen model for each pair of an  $i$  and a  $j$ .

The Lakshmanan-Hansen model is not analytically different from Huff's, except for the introduction of the parameter  $\alpha$ .  $\alpha$  allows for a relationship between floorspace and drawing power which can be described by a nonlinear equation, though not for one to which no equation can be fitted. This accommodates the observations at Haydock and elsewhere that an assumed proportionality underestimates the power of larger centres to draw lower order trade.<sup>87</sup>

Batty and Sæther<sup>84</sup> argue, however, that  $\alpha$  is more of a nuisance than an aid. They found that in six English studies its value varied from 0.92 to 1.38; in the seventh it was 1.60. They comment that if  $\alpha$  is assumed equal to 1, there is "only one parameter [and] an optimal calibration technique based on Fibonacci numbers exists". Their case depends on the plausibility of the

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<sup>87</sup> A completely different approach which appears to handle this phenomenon is offered by R. W. Bacon. (Source: Bacon 1971.) But he expressly excludes the possibility of competition within centres, and it is not apparent how Bacon's model could be tested in an empirical situation.



assumption. Parry-Lewis and Traill<sup>88</sup> maintain that wherever there is a choice of shops selling similar goods,  $\alpha \neq 1$  since two similar shops are not precisely twice as attractive as one.

Parry-Lewis and Traill, furthermore, introduce an additional independent variable,  $C_j^\delta$ , being a measure of the internal competitiveness of centre  $j$ . With this modification, the Lakshmanan-Hansen model reads:

$$S_{ij} = E_i \frac{F_j^\alpha / C_j^\delta \cdot T_{ij}^\beta}{\sum_{j=1} \left( F_j^\alpha / C_j^\delta \cdot T_{ij}^\beta \right)}$$

Regrettably, they do not describe a method of measuring  $C_j^\delta$  in any actual centre,  $j$ .

In the Parry-Lewis formulation, which is the most complex of this family of models, there are for each pair of a zone of origin,  $i$ , and a centre  $j$ , eight variables: expenditure (or expenditure per capita multiplied by population), originating in zone  $i$ , on the class of goods under consideration; the floorspace at centre  $j$ ; the competitiveness at centre  $j$ , howsoever it might be measured; the time distance from  $i$  to  $j$ ; the three constants,  $\alpha$ ,  $\beta$ , and  $\delta$ ; and the result, which is the flow of expenditure to centre  $j$  from the zone of origin under study,  $i$ .

Unfortunately, shopping behaviour may be incomparably more complex. Figure 1 on Page 12 showed a very irregular pattern of market penetration for a 'typical' store. It may be that, even

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<sup>88</sup> Source: Parry-Lewis and Traill (1967/8).

if the consumer does minimise the perceived costs of shopping over time, each consumer has a different set of trade-offs amongst prices, opportunity to compare prices, journey time, money cost of travel, choice of lines, etcetera. Nevertheless, there exists a hierarchy of shopping centres. Therefore, however irregular its pattern, the behaviour of shoppers is not completely random.

There are signs that<sup>89</sup> the Lakshmanan-Hansen model is regarded as a sufficiently accurate approximation to reality to be of service, especially in subregional planning. The careful review of models by the Economic Development Committee for the Distributive Trades,<sup>90</sup> the call to Scottish local authorities for a shopping policy,<sup>69</sup> and the need to be in a position to challenge developers' figures at Public Inquiries, are all indicators of the growing popularity of mathematics amongst governmental shopping planners.

Lakshmanan-Hansen models are used to predict the effect of alternative policies for the distribution of population and employment. Assumptions must be incorporated about changes in such variables as expenditure per head on classes of goods, in the relative cost of transport, and in the relationship between any predicted change in turnover and the consequent need for floorspace. The uncertainty inherent in these predictions compounds the

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89 This paragraph is based not only on published literature, but also on discussions held with Alistair MacLeary (Wright and Partners) and others (for list see Acknowledgments) who are involved in aspects of the development of land for retail use.

90 Source: Economic Development Committee for the Distributive Trades: Shopping Capacity Subcommittee, Models Working Party (1970).

inaccuracy of fit of the model to the real world even when calibrated with accurate data. But unless sensitivity analysis shows the conclusions to be highly dependent on the accuracy of the assumptions, the model remains useful as a better guide than hunch to land allocation.

When an individual centre or store, rather than the city-regional pattern of shopping, is under consideration, analysts tend to<sup>89</sup> favour an 'analog' approach. An 'analog' is a store, or centre as the case may be, whose characteristics approximate those of the proposed development. The shop location planner seeks situations that are parallel in terms of size<sup>91</sup> of store or centre, size and location of competition, population within each of a series of time-distance zones around the proposed site, and per capita expenditure on the goods to be sold. If he is planning for a public authority, he may be able to supplement published information by survey in his own or other towns; if he is planning for a retailer, he will also have access to data about a range of potential analogs from amongst the company's existing stores.

The simplest analog is a national average. Essentially, this was the basis of the estimate of how much floorspace ought to be provided in Livingston New Town.<sup>75</sup> The Scottish average expenditure per head, and the proportion of that on convenience goods, were lifted from the 1961 Census of Distribution. Estimates

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<sup>91</sup> Shopping policy planners normally express size in ft<sup>2</sup> (or square metres). Retailers are more likely to compare turnover per foot frontage of counter, or in the case of supermarkets per checkout, and only to convert to per ft<sup>2</sup> for presentation at Public Inquiries.

of population in 1971 and 1986 were derived from the Livingston plans themselves. Assumptions were made about turnover per square foot after consultations with knowledgeable people. Finally, there was an allowance for 'net leakage', being the difference between expenditure in Livingston by non-residents and expenditure furth of Livingston by residents. The resulting calculation procedure was:-

Estimate population in 1971 and 1986

Sales per capita 1961 = £201 (Census of Distribution:  
Scottish average)

⇒ Total sales at 1961 levels to 1971 population.

Assume 50-53% convenience.

⇒ Expenditure on (a) convenience (b) durable goods

Estimate net leakage -

	1971	%	1986
Convenience	- 5		- 3
Durables	-17		- 7

⇒ total sales in the area.

Assume average sales per ft<sup>2</sup> = £30 p.a. on convenience and £25 on durable goods.

⇒ total area required for (a) convenience (b) durables sales at 1961 volumes of trade.

⇒ area required in (i) 1971 (ii) 1986, assuming 1% growth p.a.

The population projections for 'Greater Livingston' were 119,000 in 1971 rising to 230,000 in 1986. A corresponding increase in the shopping area over the twenty years 1966-86 was therefore recommended. For it is in the nature of a New Town that the population builds up gradually from that of a village or a small town to that of a large town or a city.

Diamond and Gibb used<sup>92</sup> a more sophisticated analog technique to estimate the required size of shopping centre for the New Town of Cumbernauld. They analysed 100 existing towns in the population range 25-100,000 within 20 miles of one of the nine largest cities, after London, in Great Britain. They established the expenditure in their centres in 1959 in relation to their population, and converted each outcome to an expenditure for a town of 70,000 population. They deducted for non-central-area expenditure, largely on the basis of the number of shop units it was planned to build. The analog average central area expenditure was converted into a floorspace requirement using estimates of turnover per ft<sup>2</sup> in "well situated, well designed, and efficiently organised shops" supplied by traders and chambers of commerce. No allowance was made for trends: it was felt that while expenditure per head would rise, "there is plenty of evidence" that there is "considerable room for further improvement" in turnover per ft<sup>2</sup>, and these two trends were expected to cancel each other out.

Individual retailers, whose objective is to estimate potential sales<sup>93</sup> in a particular store, use a somewhat different type of analog. Some are prepared to scour widely in order to obtain an acceptable analog in preference to any other method of estimation. Thus, at the Cribbs Causeway Inquiry,<sup>42</sup> faced with an absence of British data at a time when no hypermarkets were

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92 Sources: Diamond and Gibb (1962) and House of Commons (1961).

93 Sales potential is only one of the criteria by which a retailer will decide where to develop. Among other important ones are costs. Sales are not independent of gross margins, either.

open, Cyriax based his calculations on a French analog.

On that basis, Cyriax estimated that a 90,000 ft<sup>2</sup> hypermarket would capture 5.8% of convenience goods turnover in the 15-minutes' drive zone and 5.4% in the 15-25 minutes' drive zone in the year of opening. He dismissed models as irrelevant on the grounds that a hypermarket relies on nonstandard factors like lower prices, greater choice, and superior quality. (Although these could render models redundant from his point of view, the planning authority might still wish to use one in their assessment of the hypermarket's impact on existing shops.) Cyriax did, however, accept the City Council's projections for numbers of households and car ownership. Also, he estimated per capita expenditure on convenience goods by scaling up national estimates in proportion to Department of Employment earnings figures.

At Chandlers Ford,<sup>41</sup> Cyriax uses a finer gradation of time-distance zones, and his result is different; but the technique is the same. It appears from Duncan and Phillips<sup>94</sup> that that used in North America by the Eastern Shopping Centers Group is also similar, except in that more data is more widely available. The Group analyses "current population in the trading area, population trends, current and potential per capita income in the area, competing centres or retailers, shopping loyalty of potential customers, road patterns, and expected sales by major classes of merchandise."

Other planners may be less sophisticated, for

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<sup>94</sup> Source: Duncan and Phillips (1951).

Applebaum is quoted<sup>94</sup> as saying that an average investment of \$373,000 in retail development is supported by an average investment in research of \$4,075. Perhaps they feel that research would not increase their success rate. It would be possible to operate accurately the most sophisticated analog and/or mathematical model and conclude by developing in a weak position.

This could certainly be because the assumptions made prove invalid or through the operation of variables excluded from the analysis. But it could also be a consequence of choosing a bad site within a good location. The relationship of a site to transport routes, to traditional circulation routes, and to competitors' positions, are among the important micro-level considerations. The style of development may affect the turnover achieved at a given site. In particular, an edge-of-town district shopping centre creates, through parking provision, an accessibility which would not be possessed by a conventional development on the same site.

In considering the merits of a proposal for such a centre, the shopping policy planner will be wary of using a Parry-Lewis type model, calibrated by analysis of conventional centres, for the purpose of estimating its turnover. He may more reliably use one for the purpose of estimating the impact on turnover in competing, conventional, centres of the proposed edge-of-town centre - having computed by analog the likely market penetration of the

latter.    Analogs will increase in number and serviceability with increasing development of edge-of-town district shopping centres in Great Britain.



## Chapter 8..      Hypothetical Example.

In order to illustrate the concept of analysis by analog, a hypothetical example has been constructed. The development would be in the Summerston area of Glasgow. This was an agricultural area, situated astride Balmore Road, northeast of Maryhill and about half-way between Bishopbriggs and Bearsden. It is being developed as a Corporation housing scheme to a target population of 8,000. Two alternative analogs to determine how much land should be allocated for a shopping centre in the middle of the development are discussed below.

If it is intended to service the area with a conventional neighbourhood shopping centre, it is appropriate to consider as analogs surrounding parts of Glasgow. The Corporation of Glasgow (C.O.G.) conducted a survey of the floorspace in existence in 1971 throughout the city, and analysed the results<sup>95</sup> in terms both of geographical areas and of the network of shopping centres. C.O.G. also calculated the total expenditure per head in 'suburban' shops in the city, i.e. other than in the city-centre. Their assumptions included:

Per capita income in Glasgow is 84.4% of the Family Expenditure Survey estimate for Scotland (on the basis of a series of 3-year averages);

expenditure in shops in Glasgow is at the same rate as in Scotland, 51.5% of per capita income;

the split between suburban and city-centre shops recorded by the 1961 and 1966 Censuses of Distribution remains correct for 1971, 21% of suburban residents' expenditure being in the city-centre.

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<sup>95</sup> Some of these are published. Source: Corporation of Glasgow Planning Department (1974). Some of the basis of this Chapter also derives from conversations with Ann Mearns (see Acknowledgements).

All data was then converted to a standard of constant 1962 prices. An estimate of average turnover per ft<sup>2</sup> per annum was derived. For the purposes of planning floorspace, tables of floorspace per capita are derived. This short-circuits the calculation of turnover per ft<sup>2</sup> and of expenditure per head, on the assumption that changes in spending power and in retail efficiency tend to cancel each other out. Within its assumptions, an index of floorspace per capita is an acceptable analog for determining the size of centre required in a new development.

Table 10 : Glasgow Shopping Centres<sup>96</sup>

	(a) 1971 population (‘000s)	(b) 1971 floorspace in 'district' and 'secondary' centres	(b) (a)
Central Northern Sectors (6,8,9,12-16,20,21) <sup>ø</sup>	187	924	4.9
Northern Sectors (8,12-16,20,21)	160	750	4.7*
Possilpark Area (13)	20	76	3.8 <sup>†</sup>
Maryhill Area (8,14A)	43	224	5.2

Centres included:

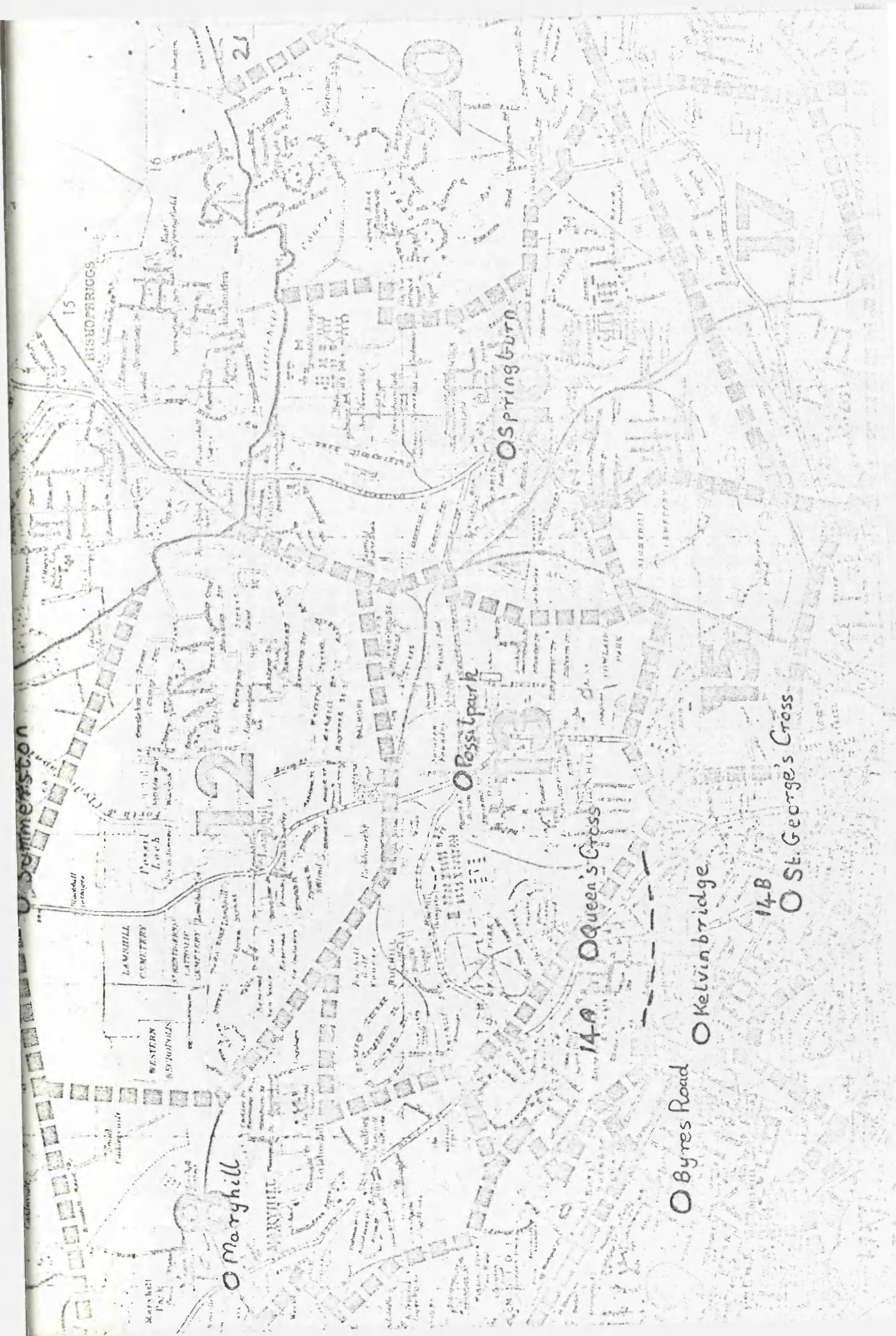
- in Possilpark : Possil Park;
- in Maryhill : Maryhill North, Queen's Cross;
- in Northern Sectors : Possil Park, Maryhill North, Queen's Cross, St. George's Cross, half of Kelvinbridge, and Springburn;
- in Central Northern Sectors : Northern Sectors plus rest of Kelvinbridge, and Byres Road.

<sup>ø</sup> Numbers in brackets refer to the areas on the map (Figure 3).

\* If the half of Kelvinbridge is excluded, this becomes 4.5.

<sup>†</sup> That Possilpark is undersupplied with shops is in line with lay opinion.

<sup>96</sup> Data from the Corporation of Glasgow floorspace survey 1971 and obtained as indicated in note 95.



The average provision of the four groupings of centres in Table 10 is  $4.6 \text{ ft}^2/\text{capita}$ , which, applied to a population of 8,000 at Summerston, suggests a requirement of  $37,000 \text{ ft}^2$ , the same as is suggested by the average of the northern sectors. The inclusion of the major district centre at Byres Road raises the areal average to  $4.9 \text{ ft}^2/\text{capita}$ , which translates to  $39,000 \text{ ft}^2$  for Summerston.

The conclusion from this analog would be to recommend a centre at Summerston of about  $38,000 \text{ ft}^2$ . It may well be that C.O.G. are in fact planning on a basis similar to this, for they are proposing that  $40,000 \text{ ft}^2$  of floorspace be constructed at Summerston. It will inevitably not be in service until after the population has arrived. The second analog now considers the opportunity of the alternative approach of providing an edge-of-town district centre in advance of their arrival.

The assumptions of this analog derive indirectly from those made by Cyriax at the Cribbs Causeway Inquiry,<sup>42</sup> the principal difference being that the breadth of catchment is reduced to take account of the different natures of the proposed centres. It should however be stressed that the proportions used here are hypothetical and have been set in a geographical context for ease of illustration.

It is hypothesised that by analog with situations in other localities, the market penetration potential of the proposed centre would be:

I. 62.5%<sup>97</sup> of the expenditure of 8,000 people (residents within  $\frac{3}{4}$  mile);

II. 6% of the convenience expenditure of 106,000 people (the Northern Sectors minus Springburn, approximately a ring one mile beyond ring I);

III. 3% of the convenience expenditure of 111,000 people (a ring one further mile beyond II, being the remainder of the Central Northern Sectors, Bishopbriggs, and Wards 2 and 4 of Bearsden, excluding everything south of the Inner Ring Road);

IV. durables expenditure amounting to  $\frac{1}{3}$  of the sum of II and III, i.e. constituting  $\frac{1}{4}$  of non-local trade.

From the C.O.G. report and the 'Census of Distribution 1971',<sup>98</sup> it is estimated that the average expenditure per head in Glasgow on convenience goods in 1975 is £134.46 at 1962 prices. Crude average income data quoted by Pearce<sup>99</sup> suggests that income-levels are 18% above average in Kelvinbridge, Bishopbriggs and Bearsden, so expenditure is adjusted to £158.66 for area II. Correspondingly, the income level in Possil and Maryhill is estimated to be 10% below average. On this basis, the expenditure level for area III becomes £121.01. The same level is taken for area I on the assumption that many of the tenants in Summerston will be persons displaced by clearance schemes.

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97 This is derived by applying Table 3B to the proportions of retail expenditure devoted to each class of goods in Scotland. (Source: Department of Trade & Industry 1972/3).

98 Sources: Corporation of Glasgow Planning Department (1974) and Department of Trade and Industry (1972/3).

99 Source: Pearce (1970).

Applying these proportions:

$$\text{I.} \quad 8,000 \times \pounds 201.70 \times \frac{62.5}{100} = \pounds 1,008,500 ;$$

$$\text{II.} \quad 106,000 \times \pounds 121.01 \times \frac{6}{100} = \pounds 769,624 ;$$

$$\text{III.} \quad 111,000 \times \pounds 158.66 \times \frac{3}{100} = \pounds 528,360 ;$$

$$\text{IV.} \quad (\text{II} + \text{III}) \div 3 = \pounds 432,661 ;$$

$$\therefore \text{I} + \text{II} + \text{III} + \text{IV} = \pounds 2,739,145 .$$

The outturn is an estimate of total turnover for the proposed centre of  $\pounds 2\frac{3}{4}$  million at 1962 prices. (For those not accustomed to 1962 prices, multiplying by 238/100 this is equivalent to  $\pounds 7$  million at 1975 prices.) If turnover per  $\text{ft}^2$  is based on the range that is obtained by the most modern supermarket, as given at the Chandlers Ford Inquiry,<sup>41</sup> it would be  $\pounds 56$ - $\pounds 70$  at 1962 prices. The Glasgow average is  $\pounds 24.16$ . Even allowing for the inefficiency of shops in tenements, C.O.G. would raise this only to  $\pounds 35$  for new shops. Accepting that a superstore would obtain a substantial saving on this level, the lower end of the Chandlers Ford range,  $\pounds 56$  would appear to be the best estimate of attainable turnover per  $\text{ft}^2$  in 1975 at 1962 prices in the Glasgow context.

The recommended area by the second analog is therefore  $\pounds 2\frac{3}{4}$  million  $\div \pounds 56$ , which is 49,000  $\text{ft}^2$ . The attraction to the retailer is that nearly two thirds of the trade he can expect when the population target is attained is already potentially available before he opens for business. If I is discarded from the above

calculations, the remaining  $\pounds 1\frac{3}{4}$  million of turnover is equivalent to  $\pounds 35/\text{ft}^2$ , a level regarded as efficient for an ordinary supermarket.

Viability at the date of opening together with a guaranteed increase in the number of highly accessible customers is a central advantage of the edge-of-town superstore to its operator; the presence of a store doing  $\pounds 1\frac{3}{4}$  million of turnover in the first year of their arrival is a central advantage of the edge-of-town superstore to the incoming residents of Summerston; the combination is the justification for planning for this kind of development in situations where circumstances resemble those in this hypothetical example.

### CONCLUSION

Town Planners have been reluctant to accommodate the pressure from the retailing industry for large units away from established shopping centres. The locations where retailers are now demanding to trade were not conceived as potential commercial land when the Development Plan zonings were allocated. Planners have preferred to approve the peripheral expansion of existing centres and to sponsor the redevelopment of central areas.

The scepticism has been greatest at local level. Central government experts have suggested that each application for a superstore or hypermarket should be treated on its merits. Few local authorities have seen any merit in any such development.

They are often afraid of the impact of a hypermarket. The incremental effect is large. Major problems of closure of other shops, of increased traffic, and of pressure on neighbouring land may be created at a stroke. In the background is the potentially serious damage that would be caused were the hypermarket to fail.

One of the advantages of a superstore is that it is a smaller risk. It is more likely that the traffic to be generated by an edge-of-town district centre will not necessitate heavy public expenditure on roadbuilding. There are more opportunities for constructing such centres where they will not lead to the closure of many shops, or where closures are acceptable.



The most favourable circumstances are where population is migrating to the periphery of the city, whether the movement be planned or voluntary. An edge-of-town centre can be planned for an area whose population is expected to build up fairly rapidly. It can be planned in conjunction with the design of the residential area, minimising disadvantageous effects on traffic and amenity. It can serve the first residents at the time of their arrival since it is not dependent on local trade, and it will be virtually assured of rising demand.

It will also be desirable to approve the construction of a superstore where it can be integrated into an existing district centre. Difficulties of making sufficient land available for parking, of accommodating the traffic generated, and of preserving the amenity of residential streets are, however, more likely to be encountered.

In either case, it is an important welfare consideration that the centre be readily accessible by public transport, or at least that as at Bridge of Dee a bus be provided. One of the differences between an edge-of-town centre and a hypermarket is that it is less likely to be realistic to provide good access to the latter by bus. The people who shop by car and keep their purchases in a deepfreeze will benefit from a superstore in many locations. Those who cannot afford these luxuries will only benefit if they can easily travel to it by bus or on foot.

The principal tenets of the planning case against

hypermarkets have been their adverse effects on other shops, on traffic, on the service available to the poor, on the green-belt or amenity, and on the prospects of town-centre redevelopment. The case argued here has been that the edge-of-town district centre need not be very damaging in its impact in any of these respects. Enough superstores are trading for the experiment to be judged. The balance of advantage is in favour of encouraging them to locate particularly in the growth zones of cities whose population is expanding or decentralising.

ACKNOWLEDGEMENTS

Thanks are due to the following people for their co-operation in providing information and ideas which have contributed directly or indirectly to this work, in addition to the published and unpublished written material in the bibliography:

Evans, Mike (Glasgow Corporation Planning Department)  
MacLeary, Alistair (Wright and Partners) (Consultants)  
Mearns, Ann (Glasgow Corporation Planning Department - Shopping Policy Group)  
Nicoll, Bill (Strathclyde University Department of Urban and Regional Planning)  
Pope, J. (The Boots Company Ltd. - Shop Development Research Unit)  
Rule, Jean (Glasgow Corporation Planning Department)  
Wilkes, Don (Coopers and Lybrand and Associates, Economic Division)

and last, but not least, my Supervisor,

Cameron, Gordon (Professor of Town and Regional Planning, University of Glasgow).

Thanks are also due to Mrs. May Morton, who typed with speed and accuracy.

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